

some of the agricultural lands in the service area, and provides storage for peaking of agricultural water.

The San Benito County Water District operates San Justo Reservoir and the Hollister Conduit.

East Side Division

New Melones Operations

The Stanislaus River originates in the western slopes of the Sierra Nevada range and drains a watershed of approximately 900 square miles. The average unimpaired runoff in the basin is approximately 1.2 million acre-feet per year; the median historical unimpaired runoff is 1.1 million acre-feet per year. Snowmelt contributes the largest portion of the flows in the Stanislaus River, with the highest runoff occurring in April, May and June. Agricultural water supply development in the Stanislaus River watershed began in the 1850s and has significantly altered the basin's hydrologic conditions.

Currently, the flow in the lower Stanislaus River is primarily controlled by New Melones Reservoir, which was completed by Corps in 1978 and approved for filling in 1983 with a storage capacity of about 2.4 million acre-feet. New Melones Reservoir is approximately 60 miles upstream from the confluence of the Stanislaus River and the San Joaquin River and is operated by Reclamation. Congressional authorization for New Melones integrates New Melones Reservoir as a financial component of the CVP, but it is authorized to provide water supply benefits within the defined Stanislaus Basin in accordance with a 1980 ROD before additional water supplies can be used out of the defined Stanislaus Basin.

New Melones Reservoir is operated primarily for water supply, flood control, power generation, fishery enhancement, and water quality improvement in the lower San Joaquin River. The reservoir and river also provide recreation benefits. Flood control operations are conducted in conformance with Corps operational guidelines. The original Melones Dam was constructed in 1924 and was operated in coordination with upstream storage facilities and Goodwin Dam downstream. The construction of New Melones Dam greatly enhanced flood control and storage capacity on the Stanislaus River.

Another major water storage project in the Stanislaus River watershed is the Tri-Dam Project, a hydroelectric generation project that consists of Donnell's and Beardsley Dams, upstream of New Melones Reservoir on the middle fork Stanislaus River; and Tulloch Dam and Powerplant, approximately 6 miles downstream of New Melones Dam on the mainstem Stanislaus River.

Releases from Donnell's and Beardsley Dams affect inflows to New Melones Reservoir. Under contractual agreements between Reclamation and the Oakdale Irrigation District (OID) and South San Joaquin Irrigation District (SSJID), Tulloch Reservoir provides afterbay storage to re-regulate power releases from New Melones Powerplant. The main water diversion point on the Stanislaus River is Goodwin Dam, approximately 1.9 miles downstream of Tulloch Dam.

Goodwin Dam, which was constructed by OID and SSJID in 1912, creates a re-regulating reservoir for releases from Tulloch Powerplant and provides for diversions to canals north and south of the Stanislaus River for delivery to OID and SSJID. Water impounded behind Goodwin Dam may be pumped into the Goodwin Tunnel for deliveries to the Central San Joaquin Water Conservation District and the Stockton East Water District.

Twenty ungaged tributaries contribute flow to the lower portion of the Stanislaus River, below Goodwin Dam. These streams provide intermittent flows, occurring primarily during November through April. Agricultural return flows, as well as operational spills from irrigation canals receiving water from both the Stanislaus and Tuolumne Rivers, enter the lower portion of the Stanislaus River. In addition, a portion of the flow in the lower reach of the Stanislaus River originates from groundwater accretions.

Flood Control

New Melones Reservoir flood control operation is coordinated with the operation of Tulloch Reservoir. The flood control objective is to maintain flood flows at the Orange Blossom Bridge at less than 8,000 cfs. When possible, however, releases from Tulloch Dam are maintained at levels that would not result in downstream flows in excess of 1,250 to 1,500 cfs because of seepage problems in agricultural lands adjoining the river associated with flows above this level. Up to 450,000 acre-feet of the 2.4-million-acre-foot storage volume in New Melones Reservoir is dedicated for flood control and 10,000 acre-feet of Tulloch Reservoir storage is set aside for flood control. Based upon the flood control diagrams prepared by Corps, part or all of the dedicated flood control storage may be used for conservation storage, depending on the time of year and the current flood hazard.

Requirements for New Melones Operations

The operating criteria for New Melones Reservoir are affected by water rights, instream fish and wildlife flow requirements (including Interior's CVPIA 3406(b)(2) fishery management objectives), D-1641 Vernalis flow requirements, dissolved oxygen (DO) requirements, D-1641 Vernalis water quality requirements, CVP contracts, and flood control considerations. Water released from New Melones Dam and Powerplant is re-regulated at Tulloch Reservoir, and is either diverted at Goodwin Dam or released from Goodwin Dam to the lower Stanislaus River.

Flows in the lower Stanislaus River serve multiple purposes concurrently. The purposes include water supply for riparian water rights, fishery management objectives, and DO requirements per SWRCB D-1422. In addition, water from the Stanislaus River enters the San Joaquin River, where it contributes to flow and helps improve water quality conditions at Vernalis. D-1422, issued in 1973, provided the primary operational criteria for New Melones Reservoir and permitted Reclamation to appropriate water from the Stanislaus River for irrigation and M&I uses. D-1422 requires that the operation of New Melones Reservoir include releases for existing water rights, fish and wildlife enhancement, and the maintenance of water quality conditions on the Stanislaus and San Joaquin rivers.

Water Rights Obligations

When Reclamation began operations of New Melones Reservoir in 1980, the obligations for releases to meet downstream water rights were defined in a 1972 Agreement and Stipulation among Reclamation, OID, and SSJID. The 1972 Agreement and Stipulation required that Reclamation release inflows to New Melones Reservoir of up to 654,000 acre-feet per year for diversion at Goodwin Dam by OID and SSJID, in recognition of their prior water rights. Actual historical diversions prior to 1972 varied considerably depending upon hydrologic conditions. In addition to releases for diversion by OID and SSJID, water is released from New Melones

Reservoir to satisfy riparian water rights totaling approximately 48,000 acre-feet annually downstream of Goodwin Dam.

In 1988, following a year of low inflow to New Melones Reservoir, the 1972 Agreement and Stipulation was superseded by an agreement that provided for conservation storage by OID and SSJID. The new agreement required Reclamation to release New Melones Reservoir inflows of up to 600,000 acre-feet each year for diversion at Goodwin Dam by OID and SSJID.

In years when annual inflows to New Melones Reservoir are less than 600,000 acre-feet, Reclamation provides all inflows plus one-third the difference between the inflow for that year and 600,000 acre-feet per year. The 1988 Agreement and Stipulation created a conservation account in which the difference between the entitled quantity and the actual quantity diverted by OID and SSJID in a year may be stored in New Melones Reservoir for use in subsequent years. This conservation account has a maximum storage limit of 200,000 acre-feet, and withdrawals are constrained by criteria in the Agreement.

Instream Flow Requirements

Under D-1422, Reclamation is required to release 98,000 acre-feet of water per year, with a reduction to 69,000 acre-feet in critical years, from New Melones Reservoir to the Stanislaus River on a distribution pattern to be specified each year by DFG for fish and wildlife purposes. In 1987, an agreement between Reclamation and DFG provided for increased releases from New Melones to enhance fishery resources for an interim period, during which habitat requirements were to be better defined and a study of Chinook salmon fisheries on the Stanislaus River would be completed.

During the study period, releases for instream flows would range from 98,300 to 302,100 acre-feet per year. The exact quantity to be released each year was to be determined based on a formulation involving storage, projected inflows, projected water supply, water quality demands, projected CVP contractor demands, and target carryover storage. Because of dry hydrologic conditions in the 1987 to 1992 drought period, the ability to provide increased releases was limited. FWS published the results of a 1993 study, which recommended a minimum instream flow on the Stanislaus River of 155,700 acre-feet per year for spawning and rearing (Aceituno, 1993).

CVPIA 3406(b)(2) operations on the Stanislaus River

Instream fishery management flow volumes on the Stanislaus River, as part of the Interim Plan of Operations (IPO), are based on the New Melones end-of-February storage plus forecasted March to September inflow as shown in the IPO. The volume determined by the IPO is a combination of fishery flows pursuant to the 1987 DFG Agreement and the FWS AFRP instream flow goals. The fishery volume is then initially distributed based on modeled fish distributions and patterns used in the IPO. Actual instream fishery management flows below Goodwin Dam will be determined in accordance with the Department of the Interior Decision on Implementation of Section 3406 (b)(2) of the CVPIA.

Bay-Delta Vernalis Flow Requirements

D-1641 sets flow requirements on the San Joaquin River at Vernalis from February to June. These flows are commonly known as San Joaquin River base flows. Reclamation has committed

to provide these flows to the best of its ability as demonstrated in the IPO during the interim period of the Bay-Delta Accord. The IPO describes the commitment Reclamation has made regarding the operation of New Melones Reservoir.

Dissolved Oxygen Requirements

SWRCB D-1422 requires that water be released from New Melones Reservoir to maintain DO standards in the Stanislaus River. The 1995 revision to the Water Quality Control Plan (WQCP) established a minimum DO concentration of 7 milligrams per liter (mg/l), as measured on the Stanislaus River near Ripon.

Vernalis Water Quality Requirement

SWRCB D-1422 also specifies that New Melones Reservoir be operated to maintain an average monthly total dissolved solids (TDS) level, commonly measured as a conversion from electrical conductivity, in the San Joaquin River at Vernalis as it enters the Delta. D-1422 specifies an average monthly concentration of 500 parts per million (ppm) TDS for all months. Historically, releases have been made from New Melones Reservoir for this standard, but because of shortfalls in water supply, Reclamation has not always been successful in meeting this objective. In the past, when sufficient supplies were not available to meet the water quality standards for the entire year, the emphasis for use of the available water was during the irrigation season, generally from April through September. D-1641 modified the water quality objectives at Vernalis to include the irrigation and non-irrigation season objectives contained in the 1995 Bay-Delta WQCP. The revised standard is an average monthly electric conductivity 0.7 millisiemen per centimeter (mS/cm) (approximately 455 ppm TDS) during April through August, and 1.0 mS/cm (approximately 650 ppm TDS) during September through March.

CVP Contracts

Reclamation has entered into water service contracts for the delivery of water from New Melones Reservoir, based on a 1980 hydrologic evaluation of the long-term availability of water in the Stanislaus River Basin. Based on this study, Reclamation entered into a long-term water service contract for up to 49,000 acre-feet per year (based on a firm water supply) and two long-term water service contracts totaling 106,000 acre-feet per year (based on an interim water supply). Because diversion facilities were not yet fully operational and water supplies were not available during the 1987 to 1992 drought, no water was made available from the Stanislaus River for delivery to CVP contractors prior to 1992.

New Melones Interim Plan of Operations

Proposed CVP operations on the Stanislaus River are derived from the New Melones IPO. The IPO was developed as a joint effort between Reclamation and FWS, in conjunction with the Stanislaus River Basin Stakeholders (SRBS). The process of developing the plan began in 1995 with a goal to develop a long-term management plan with clear operating criteria, given a fundamental recognition by all parties that New Melones Reservoir water supplies are over-committed on a long-term basis, and are thus unable to meet all the potential beneficial uses designated as purposes.

In 1996, the focus shifted to development of an IPO for 1997 and 1998. At an SRBS meeting on January 29, 1997, a final IPO was agreed to in concept. The IPO was transmitted to the SRBS on

May 1, 1997. Although meant to be a short-term plan, it continues to be the guiding operations criteria in effect for the annual planning to meet beneficial uses from New Melones storage.

In summary, the IPO defines categories of water supply based on storage and projected inflow (see Table 3-5). It then allocates annual water release for instream fishery enhancement (1987 Fish and Game Agreement and CVPIA Section 3406(B)(2) management), D-1641 San Joaquin River water quality requirements (Water Quality), D-1641 Vernalis flow requirements (Bay-Delta), and use by CVP contractors (see Table 3-6).

Table 3-5 Inflow characterization for the New Melones Interim Plan of Operation

Annual water supply category	March-September forecasted inflow plus end-of-February storage (thousand acre-feet)
Low	0 – 1,400
Medium-low	1,400 – 2,000
Medium	2,000 – 2,500
Medium-high	2,500 – 3,000
High	3,000 – 6,000

Table 3-6 New Melones Interim Plan of Operation flow objectives (in thousand acre-feet)

Storage plus inflow		Fishery		Vernalis water quality		Bay-Delta		CVP contractors	
From	To	From	To	From	To	From	To	From	To
1,400	2,000	98	125	70	80	0	0	0	0
2,000	2,500	125	345	80	175	0	0	0	59
2,500	3,000	345	467	175	250	75	75	90	90
3,000	6,000	467	467	250	250	75	75	90	90

From inspection of the above IPO allocation structure, two key New Melones – Stanislaus River water policies are inferred:

1. When the water supply condition is determined to be in the “Low” IPO designation, no CVP operations guidance is given. It is assumed the Stanislaus River Basin Stakeholders group would convene and coordinate a practical strategy to guide New Melones Reservoir annual operations under the limited water supply conditions.
2. The IPO only supports meeting the D-1641 Vernalis Base flow standards from Stanislaus River water resources when the water supply conditions are determined to be in the “High” or “Medium-High” IPO designation, and then are limited to 75,000 acre-feet of reservoir release.

The IPO supports only limited reservoir release volumes towards meeting the Vernalis salinity standards. The limited reservoir release volumes dedicated in the IPO may not fully meet the annual SWRCB standard requirement for the Vernalis salinity standard in the “Medium Low” and “Medium” years. If the Vernalis salinity standard cannot be met using the IPO-designated Goodwin release pattern, the IPO fishery volume is reduced until the Vernalis salinity standard is met, or the IPO Fishery volume is reduced to that designated in the 1987 Fish and Game Agreement. This is a consequence of Vernalis salinity standards existing prior to passage of CVPIA.

In water years 2002, 2003 and 2004, Reclamation deviated from the IPO to provide additional releases for Vernalis salinity and Vernalis base flow standards. Several consecutive years of dry hydrology in the San Joaquin River Basin have demonstrated the limited ability of New Melones to fully satisfy the demands placed on its yield. Despite the need to consider annual deviations, the IPO remains the initial guidance for New Melones Reservoir operations.

CVPIA Section 3406(b)(2) releases from New Melones Reservoir consist of the portion of the fishery flow management volume utilized that is greater than the 1987 DFG Agreement and the volume used in meeting the Vernalis Base flows.

San Joaquin River Agreement/Vernalis Adaptive Management Plan

Adopted by the SWRCB in D-1641, the San Joaquin River Agreement (SJRA) includes a 12-year experimental program providing for flows and exports in the lower San Joaquin River during a 31-day pulse flow period during April-May. It also provides for the collection of experimental data during that time to further the understanding of the effects of flows, exports, and the barrier at the head of Old River on salmon survival. This experimental program is commonly referred to as the Vernalis Adaptive Management Program (VAMP).

Within the SJRA, the IPO has been assumed as the baseline operation for New Melones Reservoir, which forms part of the existing flow condition from which flows will be provided on the San Joaquin River to meet the target flows for the 31-day pulse during April-May. Additional flows needed to meet the targets will be provided from other sources in the San Joaquin River under the control of the parties to the SJRA.

The parties to the SJRA include several agencies that contribute flow to the San Joaquin, divert from or store water on the tributaries to the San Joaquin, or have an element of control over the flows in the lower San Joaquin River. These include Reclamation; OID; SSJD; Modesto ID; Turlock ID; Merced ID; and the San Joaquin River Exchange Contractors. The VAMP is based on coordination among these participating agencies in carrying out their operations to meet a steady target flow objective at Vernalis.

The target flow at Vernalis for the spring pulse flow period is determined each year according to the specifications contained in the SJRA. The target flow is determined prior to the spring pulse flows as an increase above the existing flows, and so “adapts” to the prevailing hydrologic conditions. Possible target flows specified in the agreement are (1) 2000 cfs, (2) 3200 cfs, (3) 4450 cfs, (4) 5700 cfs, and (5) 7000 cfs.

The Hydrology Group develops forecasts of flow at Vernalis, determines the appropriate target flow, devises an operations plan including flow schedules for each contributing agency, coordinates implementation of the VAMP flows, monitors conditions that may affect the

objective of meeting the target flow, updates and adjusts the planned flow contributions as needed, and accounts for the flow contributions. The Hydrology Group includes designees with technical expertise from each agency that contributes water to the VAMP. During VAMP, the Hydrology group communicates via regular conference calls, shares current information and forecasts via e-mail and an internet website. The Hydrology group has two lead coordinators, one from Reclamation's CVO and one designated by the SJRG.

CVP-SWP operations forecasts include Vernalis flows that meet the appropriate pulse flow targets for the predicted hydrologic conditions. The flows in the San Joaquin River upstream of the Stanislaus River are forecasted for the assumed hydrologic conditions. The upstream of the Stanislaus River flows are then adjusted so that when combined with the forecasted Stanislaus River flow based on the IPO, the combined flow would provide the appropriate Vernalis flows consistent with the pulse flow target identified in the SJRA. An analysis of how the flows are produced upstream of the Stanislaus River is included in the SJRA EIS/EIR. For purposes of CVP-SWP operations forecasts, the flows are assumed to exist at the confluence of the Stanislaus and San Joaquin Rivers, and the assessment of CVP-SWP operations in the Delta effects begins downstream of that point.

The VAMP program has two distinct components, a flow objective and an export restriction. The flow objectives were designed to provide similar protection to those defined in the WQCP. fishery releases on the Stanislaus above that called for in the 1987 DFG Agreement are typically considered WQCP (b)(2) releases. The export reduction involves a combined State and Federal pumping limitation on the Delta pumps. The combined export targets for the 31 days of VAMP are specified in the SJRA: 1500 cfs (when target flows are 2000, 3200, 4450, or 7000 cfs), and 2250 cfs (when target flow is 5700 cfs, or 3000 cfs [alternate export target when flow target is 7000 cfs]). Typically, the Federal pumping reduction is considered a WQCP (b)(2) expense and the State reduction is covered by EWA actions. In 2003, however, EWA also provided coverage for the VAMP shoulder portion of the Federal pumping reduction.

Water Temperatures

Water temperatures in the lower Stanislaus River are affected by many factors and operational tradeoffs including available cold-water resources in New Melones Reservoir, Goodwin release rates for fishery flow management and water quality objectives, and residence time in Tulloch Reservoir as affected by local irrigation demand.

The current stated goal for water temperatures in the lower Stanislaus River is 65°F at Orange Blossom Bridge for steelhead incubation and rearing during late spring and summer. This goal is often unachieved. Fall pulse attraction flows for salmon managed by FWS resources helps to bring cold-water resources from New Melones Reservoir into Tulloch Reservoir before the spawning season begins.

Hydropower Operations

New Melones Powerplant operations began in 1979. New Melones Powerplant consists of two generating units with a maximum operating capability of 383,000 kW. Maximum powerplant release is 8,928 cfs. Power generation occurs when reservoir storage is above the minimum power pool of 300,000 acre-feet. When possible, reservoir levels are maintained to provide maximum energy generation.

Recreation

The lower Stanislaus River and New Melones and Tulloch Reservoirs provide significant recreation opportunities, principally boating and fishing in the lakes and rafting and fishing in the river. Rafting interests are notified concerning Goodwin flow management during spring and fall pulse flows for rafting opportunities and safety concerns.

Friant Division

This Division operates separately from the rest of the CVP and is not integrated into the CVP OCAP. Friant Dam is on the San Joaquin River, 25 miles northeast of Fresno where the San Joaquin River exits the Sierra foothills and enters the valley. The drainage basin is 1,676 square miles with an average annual runoff of 1,774,000 acre-feet. Completed in 1942, the dam is a concrete gravity structure, 319 feet high, with a crest length of 3,488 feet. Although the dam was completed in 1942, it wasn't placed into full operation until 1951.

The dam provides flood control on the San Joaquin River, provides downstream releases to meet senior water rights requirements above Mendota Pool, and provides conservation storage and diversion into Madera and Friant-Kern Canals. Water is delivered to a million acres of agricultural land in Fresno, Kern, Madera, and Tulare Counties via the Friant-Kern Canal south into Tulare Lake Basin and via the Madera Canal northerly to Madera and Chowchilla Irrigation Districts. A minimum of 5 cfs is required to pass the last water right holding located about 40 miles downstream near Gravelly Ford.

Flood control storage space in Millerton Lake is based on a complex formula, which considers upstream storage in the Southern California Edison reservoirs.

The reservoir, Millerton Lake, first stored water on February 21, 1944. It has a total capacity of 520,528 acre-feet, a surface area of 4,900 acres, and is approximately 15 miles long. The lake's 45 miles of shoreline varies from gentle slopes near the dam to steep canyon walls farther inland. The reservoir provides boating, fishing, picnicking, and swimming.